

## CLAIMS

1. A substrate holding structure comprising a support column provided at a top end portion thereof with a flanged part, and a substrate holding table joined to the flanged part, wherein:

the substrate holding table includes a heating mechanism;

the substrate holding table is provided in a lower surface thereof with a U-shaped groove extending along an outer circumferential surface of the flanged part; and

an inner circumferential surface of the U-shaped groove is connected to the outer circumferential surface of the flanged parts to form a continuous single plane.

2. The substrate holding structure according to claim 1, wherein in sectional view, both an end portion of a profile line of the inner circumferential surface of the U-shaped groove on a side of the flanged part and a profile line of the outer circumferential surface of the flanged part are situated on a single line segment extending in a vertical direction.

3. The substrate holding structure according to claim 2, wherein:

the substrate holding structure is made by joining the flanged part and the substrate holding table to each other after forming them individually; and

a joint surface between the flanged part and the substrate holding table is positioned within a range corresponding to the single line segment extending in the vertical direction.

4. The substrate holding structure according to claim 1, wherein an inner circumferential surface of the flanged part provides an inclined surface, which is inclined such that an inner diameter of the flanged part successively increases as approaching the lower surface of the substrate holding table.

5. The substrate holding structure according to claim 1, wherein:

a groove is formed in a part of a portion, opposing the flanged part, of the lower surface of the substrate holding table; and

the flanged part is joined to the lower surface of the substrate holding table only at an outermost annular area thereof.

6. The substrate holding structure according to claim 1, wherein:

the heating mechanism includes an inner heating-mechanism part and an outer heating-mechanism part formed outside the inner heating-mechanism part; and

the inner heating-mechanism part and the outer heating-mechanism part are driven by first and second drive power supply system both extending in the support column, respectively.

7. The substrate holding structure according to claim 6, wherein:

the substrate holding table includes first and second semicircular conductive patterns, which are arranged below the heating mechanism and are connected to first and second power supply lines constituting the second drive power supply system, respectively; and

the first and second conductive patterns substantially cover a whole area of the substrate holding table except for gap areas defined between the first conductive pattern and the second conductive pattern.

8. The substrate holding structure according to claim 1, wherein the substrate holding table and the support column are made of ceramics.

9. A substrate processing apparatus comprising:
  - a processing vessel connected to an exhaust system;
  - a gas supply system that supplies a process gas into the processing vessel; and
  - the substrate holding structure, as defined in claim 1, arranged in the processing vessel.
10. A substrate holding structure comprising a support column provided at a top end portion thereof with a flanged part, and a substrate holding table joined to the flanged part, wherein:
  - the substrate holding table includes a heating mechanism;
  - the support column includes, at a joint between the support column and the substrate holding table, a flanged part having an inner circumferential surface and an outer circumferential surface;
  - the inner circumferential surface provides an inclined surface, which is inclined such that an inner diameter of the flanged part successively increases as approaching the lower surface of the substrate holding table;
  - the outer circumferential surface provides an inclined surface, which is inclined such that an outer diameter of the flanged part successively increases as approaching the lower surface of the substrate holding table; and
  - the inclined surface constituting the outer circumferential surface undergoes continuous transition to the lower surface of the substrate holding table.
11. The substrate holding structure according to claim 11, wherein the lower surface of the substrate holding table is formed in a flat surface at a part joined to the flanged part and an area surrounding the part.